

# Manufacturing Process for a Surface-Mount Metal-Cavity Package for an Oscillator Crystal Blank

## Abstract

A surface-mount package for an oscillator crystal blank is made from a metal sheet substrate. Half-etched cavities are formed on one side of the sheet. The half-etched cavities are filled in with an insulator. The center of the insulator is drilled until metal is reached, leaving insulator on the sidewalls of the resulting drilled via. The bottom of the drilled via is plated with a contact metal such as nickel-gold, and then the entire drilled via is filled in with metal such as copper to form via-metal. An external metal surface-mount pad is formed on the surface of each via-metal. The metal sheet is flipped over, and a larger inner cavity etched through until the contact metal over the via-metal is reached. Conductive epoxy is placed on the contact metal, and electrodes on the crystal blank are attached to conductive epoxy.